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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,515	06/24/2003	Kazuo Takemasa	AK-418XX	8865
207	7590	02/04/2005	EXAMINER	
WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP			LEUNG, RICHARD L	
TEN POST OFFICE SQUARE			ART UNIT	
BOSTON, MA 02109			PAPER NUMBER	
			3744	
DATE MAILED: 02/04/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/602,515

Applicant(s)

TAKEMASA, KAZUO

Examiner

Richard L. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 January 2005 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4824454 (Kondo et al.) in view of US 4592205 (Brodbeck et al.) and US 5327729 (Yanai et al.). Kondo et al. disclose a system for cooling an object 19, comprising a preserving vessel 17 with a preservation chamber, which is filled with liquid cryogen 18 such as liquid nitrogen (column 1, line 12). Referring particularly to FIG. 2 and column 2, said system further comprises a Stirling refrigerator 10 and a condensing chamber 13 outside said preserving vessel 17 wherein vaporized cryogen is re-liquefied. The gas phase part of the condensing chamber 13 is made to communicate with that of said preserving vessel 17 through a pipe 15, the liquid phase part of the condensing chamber 13 is made to communicate with that of said preserving vessel 17 through a

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pipe 16 connecting between the lower part of the condensing chamber 13 and the lower part of the preservation chamber of said preserving vessel 17 (see FIG. 2 and column 2, lines 38-43), and the cooling part 21 and 22 of said refrigerator is arranged inside the condensing chamber 13. It is clear from FIG. 2 that the liquid phase part of said condensing chamber 13 is set to a position higher than that of the liquid phase part of said preserving vessel 17 since the entire condensing chamber 13 appears to be positioned higher than said preserving vessel 17. Kondo et al. fail to disclose that said liquid nitrogen in the preserving vessel is supplied from a liquid nitrogen cylinder and fail to disclose a valve associated with a liquid supply pipe from said cylinder to said preservation chamber of said preserving vessel, wherein the valve is opened to supply said liquid nitrogen to said preservation chamber when a liquid level of said liquid nitrogen in said preservation chamber, detected by a liquid level sensor in said preservation chamber, becomes lower than a predetermined level. Brodbeck et al. teach a delivery system for liquid nitrogen comprising a vessel 1 with a chamber holding liquid nitrogen (column 3, lines 21-22), a liquid nitrogen cylinder with a supply pipe 7 connected to said vessel 1 (column 3, lines 34-36), a valve 13 associated with said supply pipe 7, and a liquid level sensor 15 arranged in said chamber of said vessel. Said valve 13 is opened to supply said liquid nitrogen to said chamber of said vessel 1 when the liquid level of said liquid nitrogen in said chamber is detected to be lower than a predetermined level by said liquid level sensor 15 (column 3, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included in the system disclosed by Kondo et al. said liquid nitrogen cylinder,

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valve, and liquid level sensor arrangement taught by Brodbeck et al. in order to fill said preserving vessel with cryogen and to automatically maintain the amount of cryogen in said system during use, for example, if too much cryogen has been vaporized in said preserving vessel and the liquid level in said vessel is too low to provide proper cooling.

Kondo et al. further fail to disclose a pressure sensor arranged in said condensing chamber, and that said Stirling refrigerator is driven when a detection value of said pressure sensor is a predetermined value or higher, and further fails to disclose a gas discharge path and safety valve provided in communication with said condensing chamber that operates to relieve dangerous pressure buildup in said condensing chamber. Yanai et al. teach a condensing chamber 1 for liquefying and storing nitrogen, and located within said condensing chamber 1 is the cold part 2 and 6 of a low-temperature refrigerator 3 for use in condensing nitrogen vapor. With particular reference now to column 3, lines 22-31, said chamber 1 is provided with a pressure sensor 16 that senses the pressure within said chamber 1. If the pressure drops below a predetermined pressure, then the operation of the cold part 2 of the refrigerator 3 is stopped. In other words, the refrigerator 3 is driven when a detection value of said pressure sensor 16 is a predetermined value or higher. It would have been obvious to one of ordinary skill in the art at the time the invention was made to regulate the Stirling refrigerator disclosed by Kondo et al. using the pressure-sensor arrangement taught by Yanai et al. in order to prevent unnecessary operation of the refrigerator, particularly when there is little vapor in the chamber, and therefore reduce the energy consumption of the system. Yanai et al. further teach a gas discharge path 18 and safety valve 19 in

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communication with said condensing chamber 1, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included this safety valve arrangement in said condensing chamber disclosed by Kondo et al. in order to prevent possible rupturing of said condensing chamber if the pressure within said chamber exceeds safe operating levels, as is already commonly practiced in the art.

Response to Arguments

4. Applicant's arguments filed 28 January 2005 have been fully considered but they are not persuasive.

5. Applicant asserts that there is no support for combining the references of Kondo et al., Brodbeck et al., and Yanai et al. The Examiner respectfully disagrees. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the invention of Kondo et al. is drawn to a vessel of liquid cryogen for cooling an object with a means for recondensing vaporized cryogen using a condensing chamber and a Stirling refrigerator and a means for returning the condensed cryogen to the vessel. The invention of Brodbeck et al. is drawn to a cryogenic liquid delivery device for supplying a container with liquid cryogen and maintaining the proper amount of the cryogen in the container

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through automatic filling triggered by a liquid level sensor in the container. The invention of Yanai et al. is drawn to an apparatus comprising a chamber of cryogen, a refrigerator for condensing vaporized cryogen in the chamber, a means to regulate the refrigerator in response the sensed pressure in the chamber, and a safety valve located on the chamber.

The teachings of Brodbeck et al. are combined with Kondo et al. and are relied upon for teaching a cylinder filled with liquid nitrogen for supplying liquid nitrogen to a preserving vessel, a valve associated with a liquid supply pipe, a liquid level sensor, and the particular arrangement required by the claim. The advantages of combining the teachings of Brodbeck et al. with Kondo et al. are clearly provided in the rejection. As discussed above, the combination provides a means for initially filling the preserving vessel of Kondo et al. with cryogen, and a means to automatically maintain the amount of cryogen in said system during use, for example, if too much cryogen has been vaporized in said preserving vessel and the liquid level in said vessel is too low to provide proper cooling.

The teachings of Yanai et al. are combined with Kondo et al. and are relied upon for teaching the means to regulate a refrigerator in response to a sensed pressure and for teaching the use of a safety valve. Again, the advantages of combining the references are clearly provided in the rejection. As stated in the rejection, using the pressure-sensor arrangement taught by Yanai et al. in the apparatus of Kondo et al. would prevent unnecessary operation of the refrigerator, particularly when there is little vapor in the chamber, and therefore reduce the energy consumption of the system, and

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providing the safety valve arrangement taught by Yanai et al. in the condensing chamber disclosed by Kondo et al. would prevent possible rupturing of said condensing chamber if the pressure within said chamber exceeds safe operating levels.

The Examiner therefore disagrees with the Applicant's assessment that the combination of references is improper for lacking the necessary "teaching, suggestion or incentive to support such a combination." Applicant's additional argument that Brodbeck et al. and Yanai et al. are drawn to unrelated inventions is unpersuasive because each reference concerns the handling of cryogenic fluid and, as demonstrated above, the particular teachings from those references have clear relevance to the apparatus of Kondo et al.

6. Applicant further contends that none of the cited references discloses the limitation of having a pipe connecting between the lower part of a condensing chamber and the lower part of a preservation chamber of a preserving vessel, as required by the claim. The Examiner respectfully disagrees. Such a pipe, as discussed in the rejection, can be found in the disclosure of Kondo et al., who demonstrate a pipe (conduit) 16 connecting the lower part of condensing chamber 13 with the lower part of the preservation chamber of the preserving vessel (cryostat) 17. As recited in column 2, lines 34-43,

"In the chamber 13...gas cryogen is condensed back to liquid cryogen. Resulting liquid cryogen is, then, returned into the cryostat 17 via the second conduit 16. An upper opening and lower opening of the second conduit 16 are, respectively, positioned at a lower side of the interior portion in the chamber 13 and in the liquid cryogen 18 in the cryostat 17."

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It should be noted that the lower opening of the conduit 16 in the vessel 17 is considered to be located at the lower part of the preservation chamber of the preserving vessel 17 since it is positioned in the liquid portion, as opposed to the upper part, which is understood to be occupied by vaporized cryogen. Therefore, Kondo et al. meets this limitation of the claim, and Applicant's argument is not persuasive.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise L. Esquivel can be reached on 571-272-4808. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard L. Leung
Examiner
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